CLAIMS

1. A method of transmitting a spread spectrum signal in which a product of a lower bit rate signal and a second PN-code equals the bit rate of a higher bit rate signal, and in which a first PN-code sequence is used to spread said product or a higher bit rate signal to a predetermined output chip rate.

2. A method of recovering a spread spectrum signal having one of a higher bit rate signal spread by a first PN-code sequence and lower bit rate signal spread by the product of the first PN-code sequence and a second PN-code sequence, a product of the lower bit rate and the chip rate of the second PN-sequence equalling the higher bit rate, comprising receiving and demodulating a spread spectrum signal, successively correlating in a first operation the demodulated signal with the first PN-code sequence and then in a second operation with the second PN-code sequence and determining if a higher bit rate signal is present by checking for the presence of a strong correlation peak in the output of the first operation and no correlation peak in the output of the second operation and if a lower bit rate signal is present by checking for the presence of at least a weak correlation peak in the output of the first operation and for the presence of a strong correlation peak in the output of the second operation.

3. A method as claimed in claim 2, characterised in that the first and second operations are carried in respective matched filters.

4. A method as claimed in claim 3, characterised in that a moving average of the respective matched filters is obtained in order to synchronised detection of peaks in the output of the respective filter.

5. A method as claimed in claim 4, characterised in that the running average is determined in accordance with the equation:

$$\hat{x}_i^n = \alpha * \hat{x}_i^{n-1} + (1-\alpha) * \hat{x}_i^n$$

where $x_i^n$ is the absolute value of the $i$ th matched filter output sample in the $n$ th databit period,

$\hat{x}_i^{n-1}$ is the corresponding $i$ th sample running average at the end of the $n$-1 th databit period, and

$\alpha$ is the averaging gain and has a value between $0 \leq \alpha \leq 1$.

6. A method as claimed in claim 5, characterised in that $\alpha$ has a value > 0.5.

7. A spread spectrum communications system comprising a transmitting station for transmitting a signal having one of a higher bit rate and a lower bit rate, the transmitting station comprising a source of a lower bit rate signal, means for multiplying the lower bit rate signal by a second PN-code sequence to give a product having a chip rate substantially equal to the bit rate of the higher bit rate signal, a source of the higher bit rate signal, means for multiplying the higher bit rate signal, if present, or said product, if present, by a first PN-code sequence to give a spread spectrum signal having a predetermined output chip rate signal, and at least one receiving station having means for receiving and demodulating the spread spectrum signal, first means for correlating the demodulated signal with the first PN-code sequence, second means for correlating the output from the first mentioned correlating step with the second PN-code sequence and means for determining the presence of a higher bit rate signal by checking for a strong correlation peak in the output of said first means and no correlation peak in the output of said second means and for determining the presence of a lower bit rate signal by checking for at least a weak correlation peak in the output of said first means and a strong correlation peak in the output of said second means.

8. A spread spectrum receiver for receiving at anyone time a signal having a higher bit rate spread by a first PN-code sequence and a signal

having a lower bit rate which has been spread by the first PN-code sequence and a second PN-code sequence, the product of the lower bit rate and the second PN-Code sequence equalling the higher bit rate, the receiver comprising means for receiving and demodulating the spread spectrum signal, first means for correlating the demodulated signal with the first PN-code sequence, second means for correlating the output from the first mentioned correlating step with the second PN-code sequence and means for determining the presence of a higher bit rate signal by checking for a strong correlation peak in the output of said first means and no correlation peak in the output of said second means and for determining the presence of a lower bit rate signal by checking for at least a weak correlation peak in the output of said first means and a strong correlation peak in the output of said second means.

9. A receiver as claimed in claim 8, characterised in that wherein said first and second means for correlating comprise respective matched filters.

10. A receiver as claimed in claim 9, characterised in that each of said matched filters is coupled to means for obtaining a running average and in that means are provided for determining synchronising peaks in the respective running averages.

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